ABSTRACT

A new combustion chamber design for a quench gasifier. Electrical heating is used in the throat area of the combustion chamber to achieve temperatures up to 3500 ^{0}F to melt ash deposits and to increase carbon conversion (reduce soot production). Silicon carbide and/or silicon nitride refractory materials are used in the hot face of the throat to withstand high temperatures and high temperature shocks. The proposed design reduces the capital cost of a gasification plant by eliminating the need for soot recovery and recycle system. This design also reduces the operating cost of the gasification plant by decreasing the frequent refractory damages that have been experienced in the throat area of the existing quench gasifiers.